



For now &  
our future

# Estuaries: What's the difference?

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# Acknowledgements

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# Southland's estuaries



# Estuary hydrology

River dominance

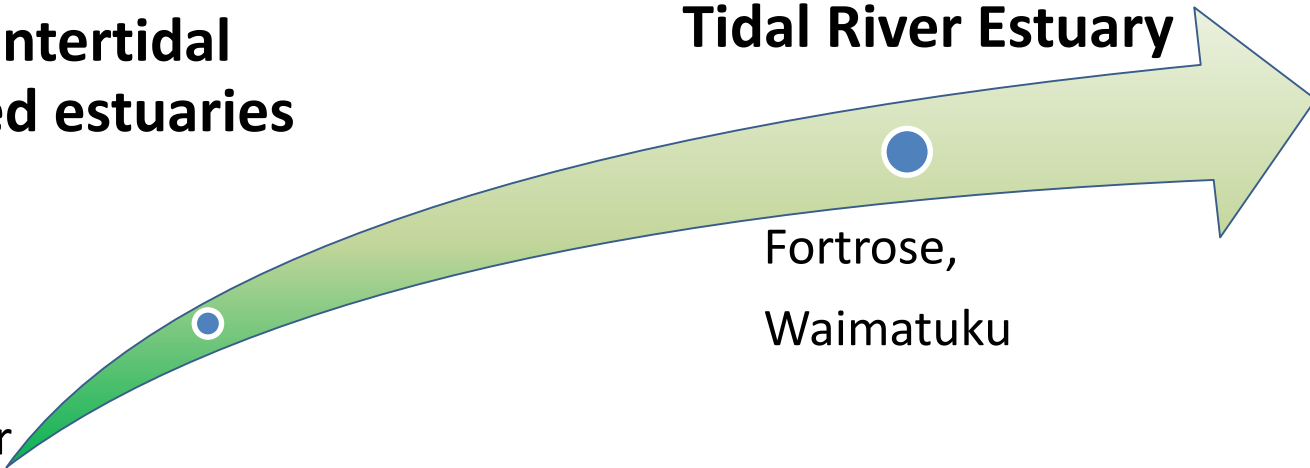


**Shallow, Intertidal dominated estuaries**

**Tidal River Estuary**

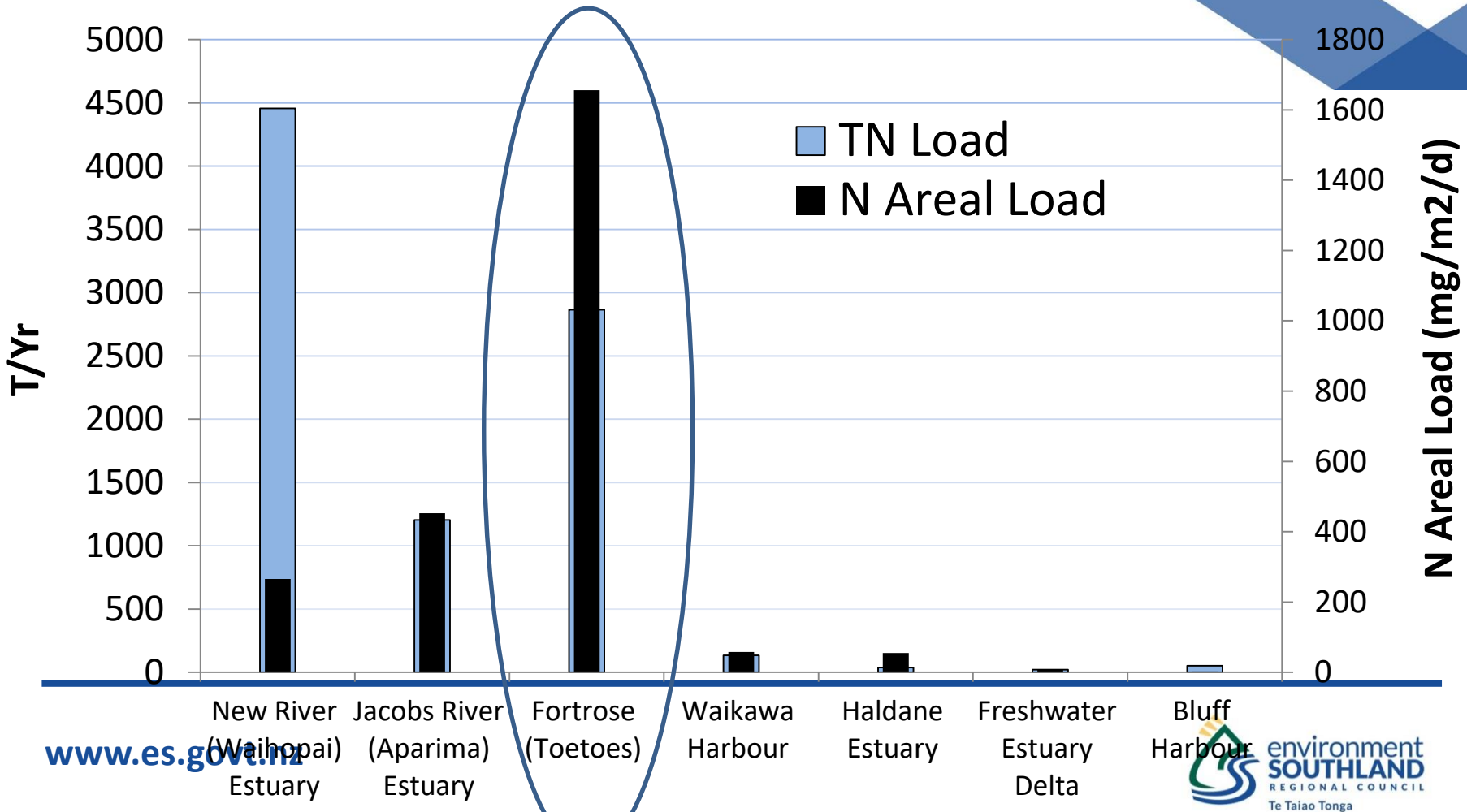
Haldane,  
Waikawa,  
New River,  
Jacobs River

Fortrose,  
Waimatuku



More sensitive to load

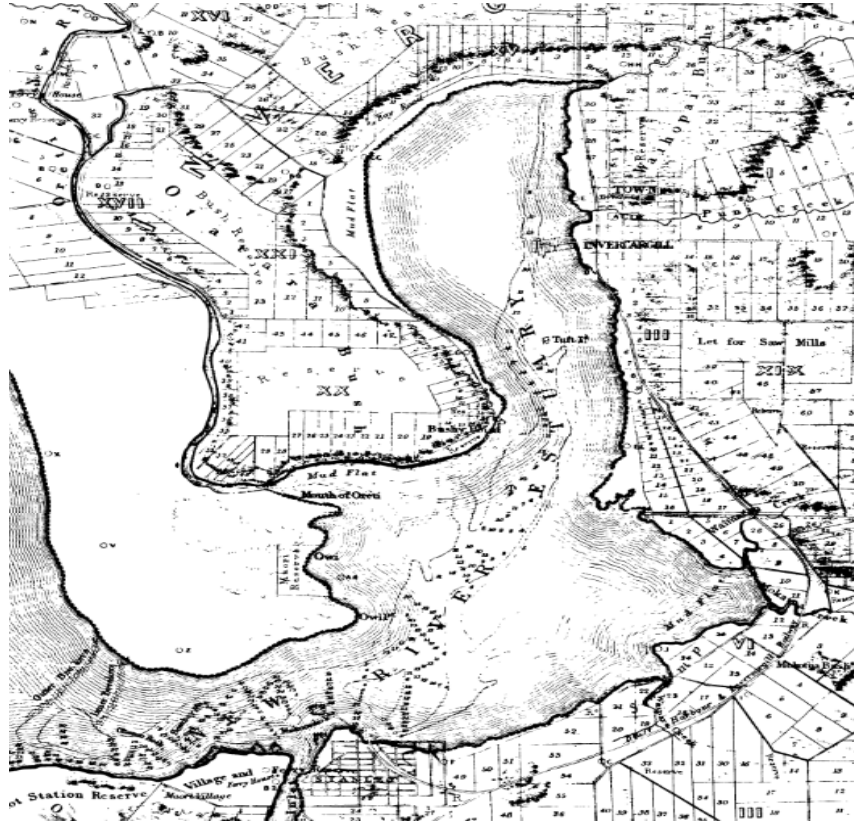






# Reclamation

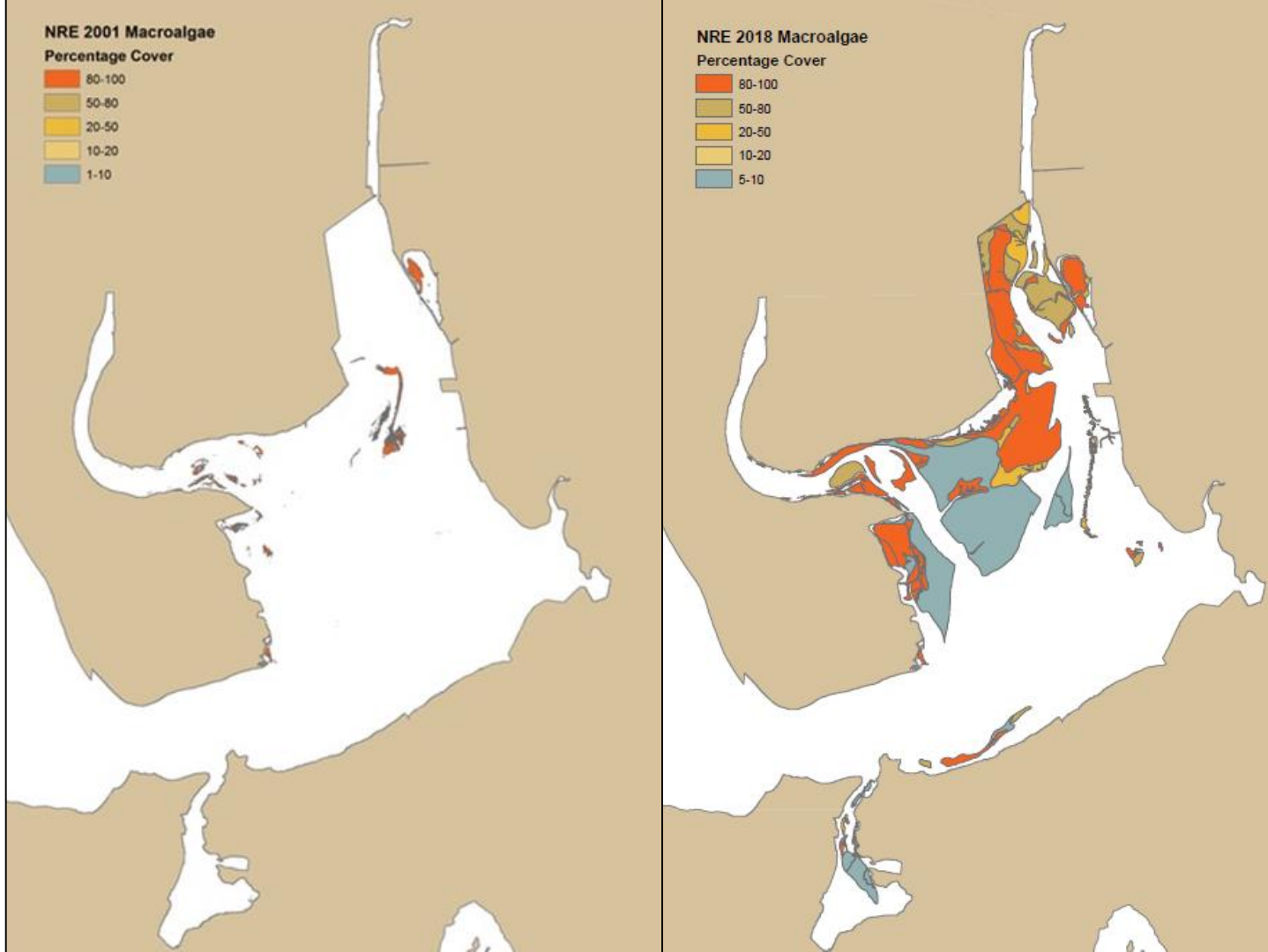
1865



2011

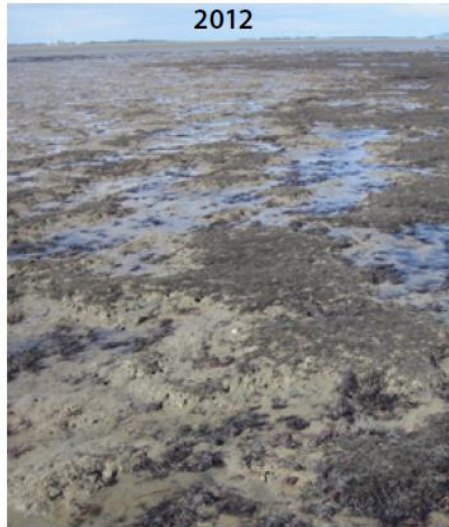


# Change in seaweed cover





Mobile sands, 10% macroalgal cover, aRPD >5cm.



Muddy sands, 20-50% macroalgal cover, aRPD 3-5cm.



Soft muds, 80-100% macroalgal cover, aRPD 1-3cm.



Soft muds, 80-100% macroalgal cover, aRPD 0-1cm.





## GEZ

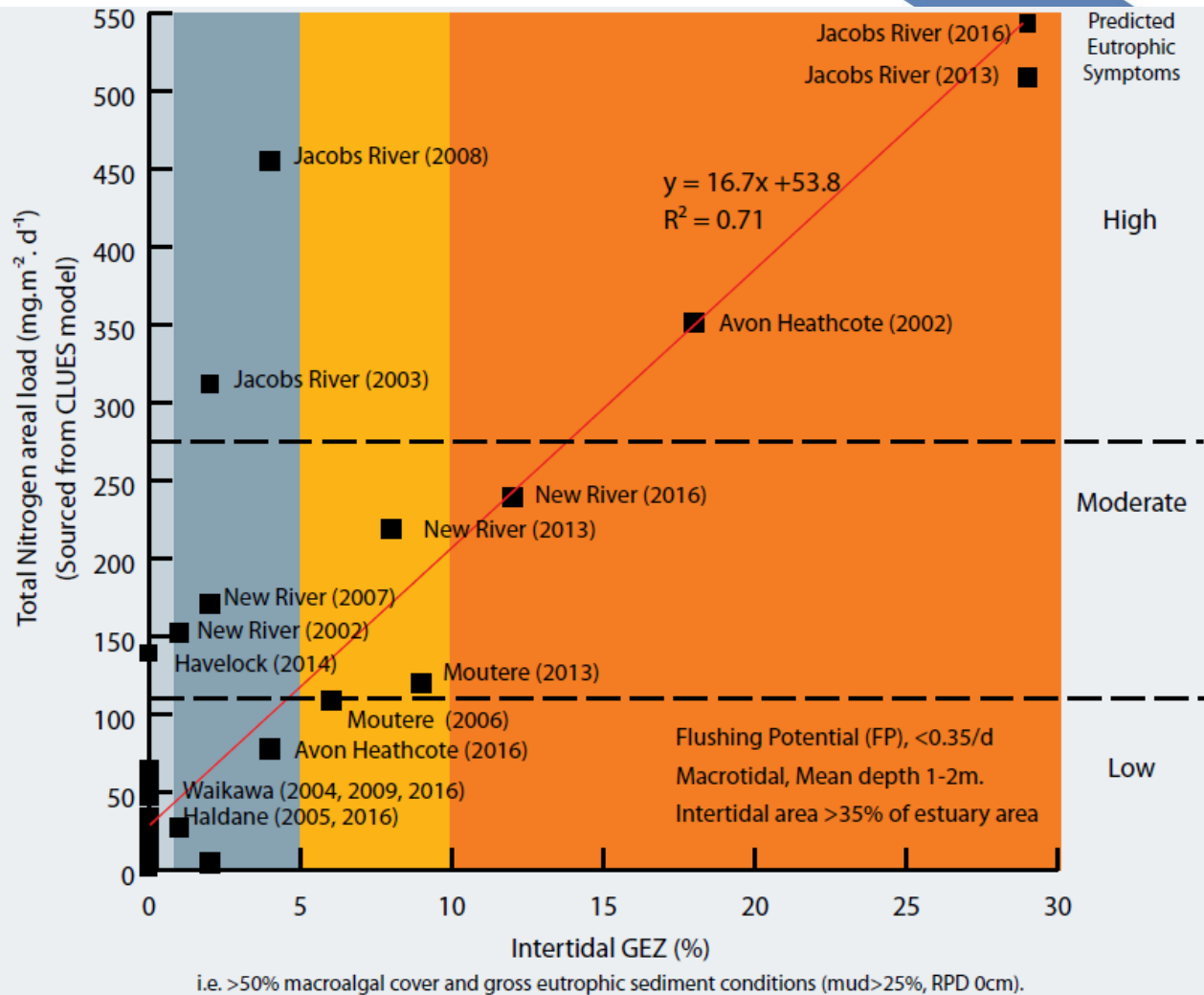
>50% Macroalgae cover

>25% Mud content

No oxygen



# Shallow, Intertidal dominated estuaries



# Conclusions

- Load/state relationship approach promising
- Waikawa/Haldane is more sensitive to nutrient increase (than estuaries types such as Fortrose)
- We need to know more about the sediment

# Environmental gradients

- Management decisions
- Triage of estuaries! How?
- Legacy effects?
- Other hydrology types?